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MARCH 2001

NUMBER 3

THREE DOLLARS

# POLICE

THE LAW ENFORCEMENT MAGAZINE

A BOBIT PUBLICATION

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# Well Seasoned Suspects

*At up to 12 rounds a second, this is one pepper-ball delivery system that can really make their eyes water!*

**T**his is one of those systems that comes along and makes you smack yourself on the forehead and say, "Duh, why didn't I think of that?" One of the captains I work with in our training division came up and said, "Hey Dave, take a look at this and tell me what you think." After years of going off into the woods with friends and playing paintballs, I immediately recognized the object he handed me as a really well built paintball gun. I told the captain I'd seen these before and this one looked very nice but we recently abandoned a very good program using paintball guns in force-on-force, officer safety and field tactics courses. We had transitioned to a Simunitions™ system for a more realistic feel. I also said that at this time in my life, I leave running around in the woods playing capture the flag to younger officers.

DAVE DOUGLAS



AM 85 Automatic Rifle with 25-round magazine and a 60-round forward magazine. Jaycor's most popular seller can deliver 85 total rounds at up to 12 rounds a second! That will get their attention.

He shook his head and got that "I'm very disappointed in you, Sergeant" look they teach them in captain school. He then very carefully explained to me that what I was looking at was a chemical agent and extended impact delivery system that a nuclear physicist thought up. I was about to call psych services when he took me outside and demonstrated the system. About ten seconds into the demo, I thought "Why did it take a nuclear physicist? Any of us could have come up with this." But we didn't, of course.

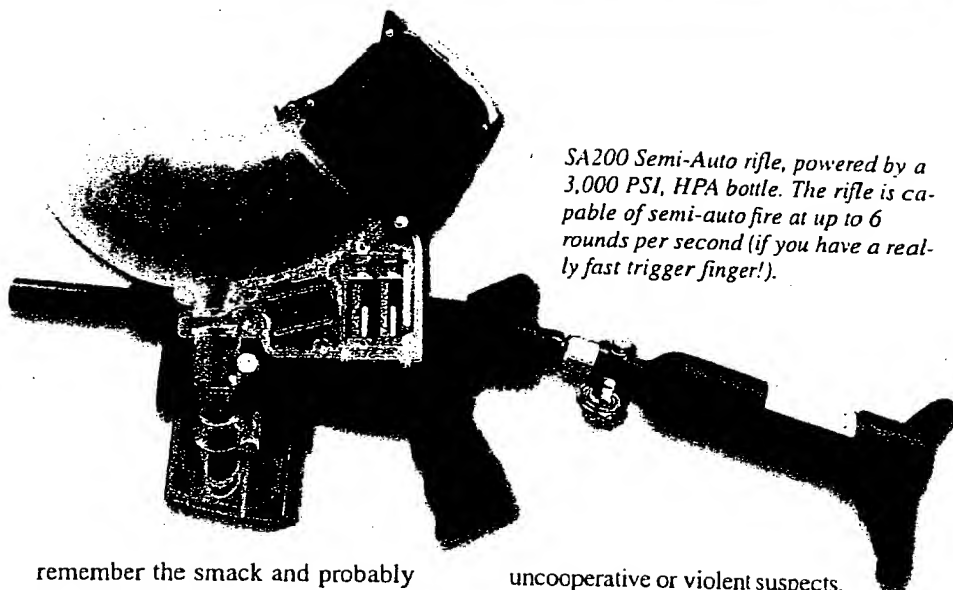
#### How it happened

The developer of this system is Jaycor Tactical Systems (JTS). It was formed in 1998 and inherited a strong history of weapons-engineering from its parent company, Jaycor. The parent company entered the defense sciences industry in the late 1970s. It developed guidelines for the employment of non-lethal technology in "operations other than war" for the military (only the Feds would think up a term like that). The company developed a wireless Taser™-like projectile for the Defense Advanced Research Projects Agency. Jaycor participates at the board-level in the National Institute of Justice Office of Law Enforcement Technology. JTS is focused on developing, manufacturing and distributing non-lethal weaponry for military and law enforcement markets.

JTS felt the timing was right for the introduction of a non-lethal deployment device for peace officers. The PepperBall System is in use by police departments across the United States. It has been successfully deployed in numerous field and corrections incidents, the most widely visible of which was the 1999 WTO riots in Seattle, Washington. The PepperBall System combines kinetic impact technology with Oleoresin capsicum (OC) pepper powder irritant.

#### Ouch!

If you ever played paintballs you can



*SA200 Semi-Auto rifle, powered by a 3,000 PSI, HPA bottle. The rifle is capable of semi-auto fire at up to 6 rounds per second (if you have a really fast trigger finger!).*

remember the smack and probably the welt that grew from it when your opponent took you out. The PepperBall is harder and stings much more than paintballs. It jumps out of the barrel at between 300 and 380 feet per second. One of the

uncooperative or violent suspects. It's real hard to rub that "owie" on your chest or arm while it turns into a big red welt while every mucus membrane you own feels like it has someone working it over with a blowtorch.

**It's real hard to rub that "owie" on your chest or arm while it turns into a big red welt while every mucus membrane you own feels like it has someone working it over with a blowtorch.**

very bright engineering ideas built into the system is the use of a frangible carrier for the OC. It allows the PepperBall to be used at point-blank range without causing great bodily harm. Of course, as with all impact or extended impact systems, certain areas are off limits. We don't hit in the neck or head with a PR-24 or straight stick. The same applies for the PepperBalls. The pain compliance in addition to the application of oleoresin capsicum has a synergistic effect in the apprehension of

#### Versatility is best

The system can be used in a number of different situations. Projectiles can be liquid or powder. Liquid has more staying power when deployed on clothes while powder dissipates rapidly. New tactics can be developed for barricade and standoff situations by delivering OC powder from a distance. Officers can contaminate the immediate area by targeting areas above and around a suspect. We can also deliver

**B**ut if you want to get really serious,  
there is a 200-round hopper that  
can cause more damage than shooting.  
"Old Yellow" is a good therapy session  
for depressed shooters.

OC on suspects en-  
closed in automo-  
biles by

launch-  
ing an initial glass-  
shattering "IceBreaker" projectile fol-  
lowed by a series of PepperBall  
projectiles. Corrections officers can  
use the system for cell extractions. By  
"Snow storming" the cell walls and  
ceiling to allow OC powder to fall be-  
hind the barricade they can drive out  
barricaded inmates. Large areas can be  
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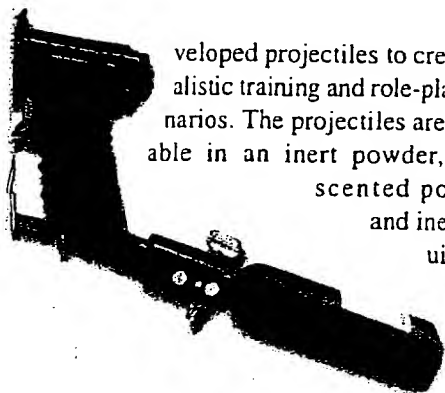
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ventilation systems can be avoided due to  
the localization with the PepperBalls.  
Clean up is simple. Sweep up or rinse off  
the powder and discard in the trash.  
Additionally, the psychological impact of  
being shot, combined with the kinetic im-  
pact and pepper effect may allow officer  
time to affect an arrest of a suicide-by-car  
subject without the use of lethal force.

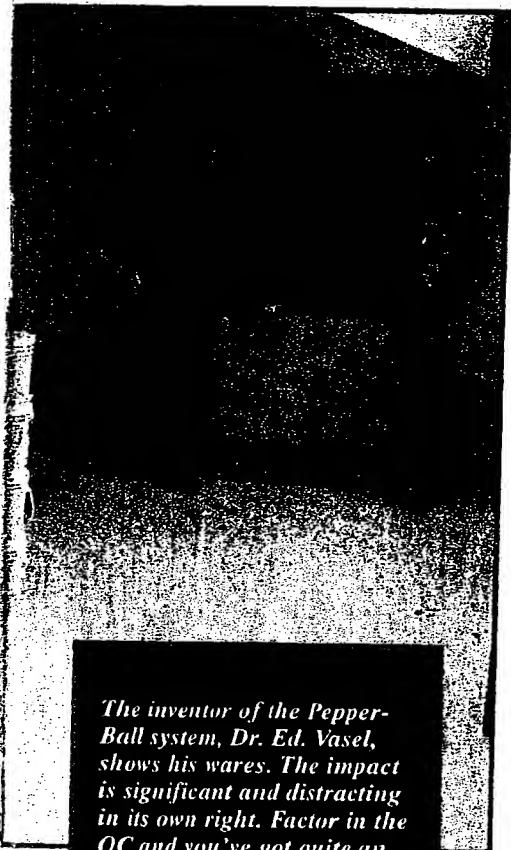
There is no substitute for realistic  
training. Jaycor Tactical Systems has de-

AM 10 Automatic Rifle with Powered 200-round capacity hopper. This Jaycor model is built for heavy-duty applications.



veloped projectiles to create realistic training and role-play scenarios. The projectiles are available in an inert powder, inert scented powder and inert liquid ver-

sions. It makes it possible to conduct both indoor and outdoor live-fire training without contaminating an area with OC powder.



*The inventor of the PepperBall system, Dr. Ed. Vassel, shows his wares. The impact is significant and distracting in its own right. Factor in the OC and you've got quite an attention-getter. By the way, Ed is known as "Dr. Pepper" around the shop.*

#### The Hardware

The PepperBall Systems are available from a pistol delivery system to a fully automatic M4 / AR15 look-alike. The automatic system puts out 12 rounds a second. Capacity varies from

eight rounds in the pistol to a 25 round magazine in the rifle configuration. But if you want to get really serious, there is a 200 round hopper that can cause more tears than showing "Old Yeller" at a group therapy session for depression sufferers. The hopper fits everything but the pistol. The power to launch the projectiles is provided by High Pressure Air (HPA) bottles that attach directly to the launchers. A valve attached to a SCUBA tank accomplishes refills easily.

Currently, PepperBall Instructor Certi-

fication Courses are held at the Jaycor Tactical Systems headquarters in San Diego, California. Jaycor will be taking the one-day course on the road throughout the US next year. You can check their Website ([www.pepperball.net](http://www.pepperball.net)) for a course near you. ■

*Dave Douglas is a sergeant with a department in Southern California and is currently in charge of In-Service Training at the regional academy. He also enjoys hot sauce on his tacos.*



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**POLICE**  
THE LAW ENFORCEMENT MAGAZINE



# PepperBall: The New Generation of Nonlethal Compliance Tools

by James Topham\*

*Editor's Note: This article continues CMR's series on use of force, officer safety, and facility security. As a rule, CMR avoids mentioning the names of vendors and product brand names. In this article, however, it is not possible to discuss this unique oleoresin capsicum delivery system without references to the manufacturer.*

Law enforcement and corrections officers are being faced with a more violent and unpredictable society than ever before. But that same society is demanding that law enforcement officers use less-than-lethal and nonlethal tools when the situation permits. Whether confronted with a suicide by cop, domestic disturbance, civil unrest, or a social event gone bad, officials need the tools to properly and safely control the offenders and protect officers. Let's face it: In recent history law enforcement has not been confronted with the degree of civil unrest and rioting that we have seen in the past year. Likewise, violence is increasing in prisons and large jail systems as a result of the growing strength of prison gangs and an increasing willingness on the part of prisoners to aggressively resist the lawful efforts of corrections officers. The dramatic increase in these types of incidents has brought less-than-lethal and nonlethal delivery systems to the forefront of police and corrections agencies alike.

## Safe, Effective Nonlethal Compliance System

The PepperBall System from Jaycor Tactical Systems (JTS) provides law enforcement officers with a safe and effective form of nonlethal compliance. PepperBall offers a unique combination of kinetic impact and oleoresin capsicum (OC) powder that sets this tool apart from other nonviolent compliance systems. Add to that combination the psychological effect of being shot, and the PepperBall System delivers a threefold solution.

\*Lt. James Topham serves as a training coordinator for the Merrimack County Department of Corrections. He is a 14-year law enforcement veteran, former deputy sheriff, and police officer. Lt. Topham also holds numerous instructor certifications in law enforcement including adjunct instructor for the New Hampshire Police Standards and Training Council in defensive tactics and knife defense. He is also a

The PepperBall System uses .68-caliber, high-pressure, air-powered, recoilless launchers to fire projectiles filled with OC powder. PepperBall Projectiles are the same caliber as paint balls—.68—but the similarities end there. PepperBall Projectiles are hard, frangible spheres that burst on impact, getting the subject's attention with pain, while potentially incapacitating him with a cloud of OC. Users report that the pain penalty from a PepperBall Projectile is consistent with a paint ball round, but studies demonstrate that the kinetic energy of the PepperBall System is actually less than most paint-ball guns since the mass of the Pep-

perBall Projectile is less than a gelatin paint ball. The PepperBall Projectile may, however, cause greater sting than a paint ball due to its hard shell.

perBall Projectile is less than a gelatin paint ball. The PepperBall Projectile may, however, cause greater sting than a paint ball due to its hard shell.

**Launcher.** JTS offers pistol and rifle launcher configurations in selectable semi-automatic and automatic versions. These systems have capacities ranging from 8 to 200 rounds and firing rates from six to 12 projectiles per second. All of the rifles use a 3000-psi high-pressure air (HPA) bottle. Under optimal conditions, users can expect to get 200 shots from one fill of a 3000-psi bottle before needing to refill. The 3000-psi HPA bottle is refilled with an 80 cubic foot SCUBA tank using a fill station adapter sold by JTS. An 80 cubic foot SCUBA tank at 3000-psi will give between 40 to 45 useable launcher bottle fills. Because each bottle fill draws some pressure away from the SCUBA tank, a usable fill is defined as having between 1500-psi to 3000-psi in the bottle. PepperBall Launchers are factory set to fire at a velocity between 350 to 380 feet per second.

All PepperBall Launchers can target accurately at distances up to 30 feet, and PepperBall Projectiles are muzzle safe at point-blank range. For OC area satura-

hard surface such as a car, wall, or ceiling at distances up to 100 feet. As with deployment of any OC agent device, wind, temperature, and humidity conditions, as well as the surrounding area, need to be considered when evaluating the use of OC irritants.

**Projectiles.** There are currently four types of PepperBall Projectiles available:

1. Live Oleoresin Capsicum (OC) Powder Projectiles (color code Red);
2. Scented Inert Powder Projectiles (color code Purple);
3. Inert Powder Projectiles (color code Blue); and

4. Inert Liquid Projectiles (color code Clear).

PepperBall Projectiles utilize oleoresin capsicum (OC) powder equivalent in "hotness" to current standard law enforcement OC products, which may contain 5% to 10% OC. A PepperBall Projectile impacts with 10 to 12 foot-pounds of force. The launchers deliver the projectiles with enough kinetic energy to produce temporary abrasions, bruises, or welts, that usually disappear in one to two weeks. The projectiles have an operating temperature range of minus 30 to 150 degrees. PepperBall Projectiles currently have a shelf life of two years, and that lifetime is expected to continue to grow as the projectiles have only been in existence since 1998, but are continuing to stand the test of time.

Response to inhaling the OC powder from a PepperBall Projectile varies among individuals. In most cases, the same effects occur as when using pepper spray:

- Involuntary closure of the eyes;
- Burning sensation of the skin; and
- A respiratory effect of gagging or coughing.

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***Society is demanding that law enforcement officers use less-than-lethal and nonlethal tools when the situation permits.***

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The symptoms last between five and 10 minutes. Medical care will not be required for suspects shot with projectiles in most cases; fresh air and cool water is sufficient for recovery. The powder can be easily cleaned up from walls, floors and other surfaces with a broom or hose.

### Training the Trainers

JTS requires law enforcement agencies to certify at least one officer as a PepperBall Instructor before allowing the purchase of the PepperBall System. The PepperBall Instructor Certification course begins with a half-hour demonstration of system capabilities. That demonstration is followed by a four hour class during which officers learn all aspects of system operations, safety, maintenance, and deployment. Successful completion and certification allows the officers to train their department personnel.

**Targeting areas.** Unlike other systems,

the PepperBall System does not force the officer to change targeting areas. Certain less-than-lethal systems require officers to be trained on proper targeting areas to prevent seriously injuring or killing a suspect. They also must understand the minimum range and conditions where some of those systems can be deployed. With PepperBall, the target for officers is the same as with their sidearm—center of mass. There is no minimum distance from which PepperBall Projectiles must be fired. Rounds are safe at point-blank range, although it is recommended that officers stand back at least eight feet to prevent the suspect from trying to wrestle away the weapon.

**No formal range necessary.** Another added training benefit is that no formal range is necessary. Because the launchers are muzzle safe and operate on high-pressure air, a parking lot, garage, classroom, virtually any area with a solid backdrop can be used. Hard targets are needed because the rounds will penetrate paper or cardboard; an industrial portable target,

metal targets, plywood, or even a trash can with a shirt placed over it all make suitable targets. Clean up can be accomplished quickly with a broom, mop, and bucket.

**Risk-free training course.** Agencies that are evaluating the PepperBall System can send personnel to the Instructor Certification course at no risk. The \$150-per-person cost will be added onto the initial invoice if and when an agency decides to purchase a system. If an agency decides not to purchase, no training charges will be incurred.

### Update Your Tactical Toolbox

Less-than-lethal munitions will unquestionably serve to improve use-of-force options and help promote professional handling of violent subjects. Using such technologies can benefit law enforcement and corrections. PepperBall appears to offer an improved and safer OC delivery system for many use of force situations and should provide an excellent addition to an agency's tactical toolbox. ■



Training

# The Fee

## Jim Topham

*Memories of the fourth annual mock prison riot training exercise last spring might be fading but revisiting it in this article can crank up anticipation for the next one in May 2001. Excerpts from four attendees who commented on the event will help you understand what makes this training so valuable. Let Kevin, Jim, John, and Dan, our guest contributors and each a CERT leader for his own department, share thoughts about the event.*

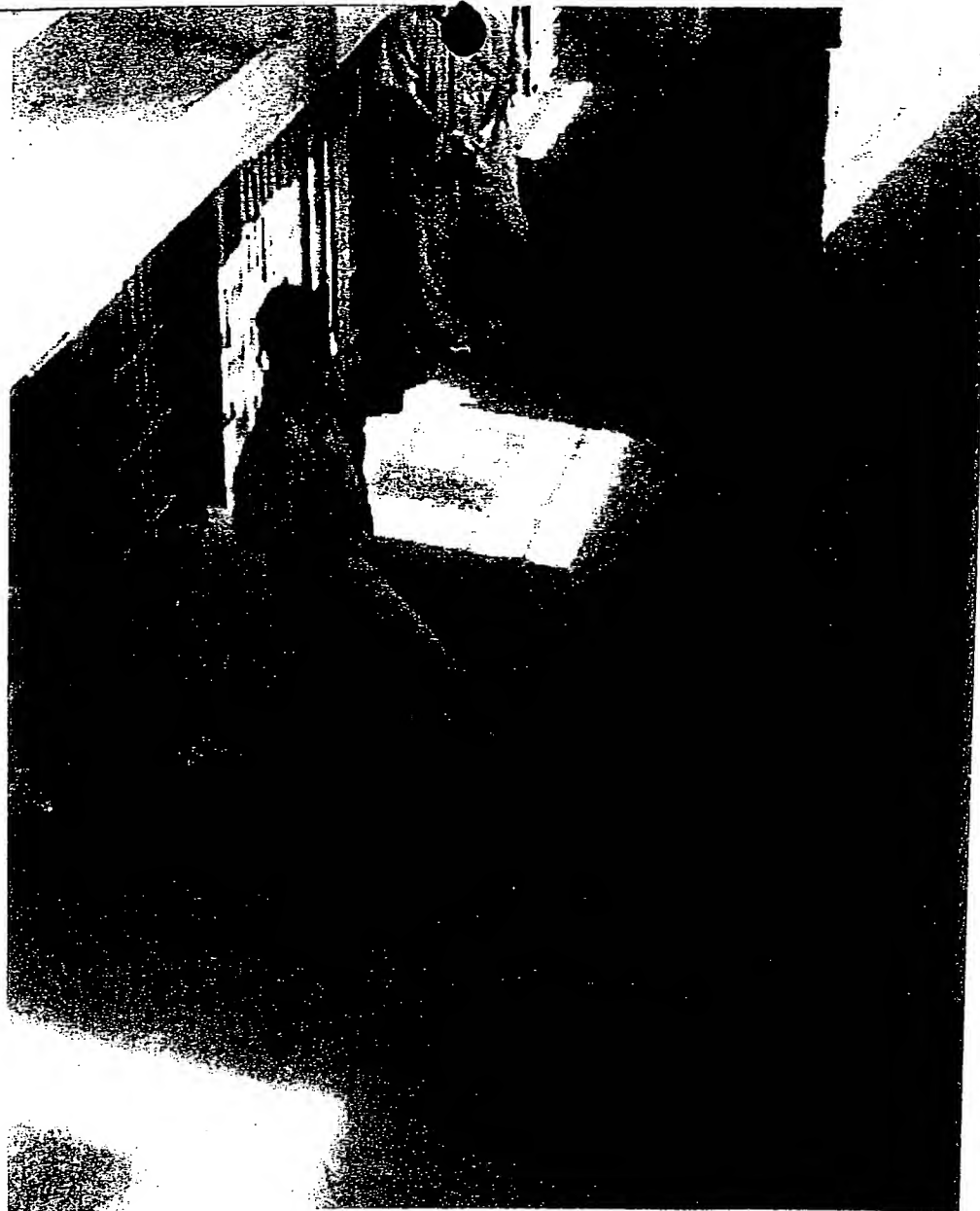
**B**ehind prison walls, an inmate sporting event goes bad and there is a riot.

An afternoon meal erupts and the next thing you know there is a riot.

Though you plan for these events do you ever really get to put that training to use in scenario-based situations? Do you have the equipment and technology to handle such a situation? How do you prepare before the real thing happens?

One thing you can do is go to the riot academy and put your team through its paces of high-intensity scenarios and review. You'll see the latest in technology at this one-of-a-kind event designed for the correctional officer.

Late last spring, the Office of Law Enforcement Technology Commercialization (OLETC) in conjunction with



the Moundsville Economic Development Council and the West Virginia Division of Corrections held the fourth annual Mock Prison Riot at the former West Virginia Penitentiary, in Moundsville, WV.

The event saw corrections professionals from across the country show up to review technologies. This gave corrections officers and response teams an opportunity to use and evaluate emerging technologies in riot training scenarios.

It was conducted on the grounds of the former West Virginia State Penitentiary. In being able to have scenarios in an actual prison facility it pro-

## Full-Speed Training Scenarios





vided correctional officers with significant training on how to best approach and handle riot situations.

The mock riot allowed officers to use the latest tools before making a decision about purchasing them. Four corrections officers who attended offered their opinions to *CTM*. Here are some of their comments:

### Kevin: Got In The Flow

"My name is Sgt. Kevin Serapiglia. I have worked 10 years with Rhode Island DOC and currently am the commander of the Chemical Munitions Unit, CERT.

"As a rookie to this event, I had a lot to see in a short time. The events were scheduled in a manner that allowed spectators to move from one to the other, which made things easy for me.

"An area that I had much interest in was less-lethal rounds for shotguns. I have been through the process of testing all of the various rounds on the market.

"I was not surprised to see the large amount of less-lethal technology being displayed. I, for one, think that less-lethal technology is a good move for our industry. Not that I would ever agree to put aside our lethal weapons or technology, I believe we need to maintain our arsenals with these tools. However, I know we need to incorporate this new technology and we will benefit from moving with this trend, and not fighting against it."

### Jim: Wants It Expanded

"My name is Jim Romanski. I am the Special Operations Response Team Commander for the Colorado DOC. I have worked in corrections for 13 years and have been an active member of SORT for all 13 of those years. I have held every position from rear security and point man to squad leader and team leader. My current position for the last 3 years has been commander. I am a sub-gun, tactical hand-gun, and shot-gun instructor.

"[I] thought the mock prison riot training was informative as far as how other teams throughout the corrections and law enforcement community train. I had the opportunity to watch several teams from the east coast set up and resolve scenarios.

"It was quite refreshing to see that I was in the same category, as far as tactics go, for deploying my team. I had five operators with me from Colorado and four of them were disturbance control, or ERT commanders. The other one was a tactical guy. Our guys had room-clearing and rescue classes right before the scenarios. Next year we will bring a full tactical squad to see how we compare.

"The vendors also played a role. We had a chance to use weapons, flash-bangs, ballistic vests, laser stun shields, multipurpose gloves, and even the camera-mounted goggles that have a live-feed T.V. monitor which could be viewed from a command center.

"I would like to see a couple more days so all the vendors could demo their equipment, and then the teams could play with them prior to going into a situation where they aren't really sure how to use the equipment. Also, this would give us more time to pick their brains about what we need, and to get other teams' opinions because they may be already using it."

### John: We're Not Alone

"My name is Captain John Kingston and I am a 15-year veteran of the Pennsylvania DOC and have been actively involved in emergency response since 1986.

"[At the mock riot] an agency's tactical officers got to observe and train with tactical counterparts from across the country. You would be amazed at how the tactical men and women seemed to gravitate toward each other. It did not matter where they were from or the size of their facility.

"We all love to talk shop...there

was a genuine, down-home, everybody-to-the-table' feeling of family. The hospitality extended by the community was expressed in a number of ways. Invited as observers in 1997, my group was given an in-depth narrative of Moundsville's colorful and violent history by Paul Kirby, the current Commissioner of the West Virginia DOC.

"Kirby had wished to develop an event which would allow senior supervisory staff and tactical officers the opportunity to get hands-on exposure to the latest technologies for the corrections profession. This was a new concept for corrections.

"Since the first mock riot, the event has developed...and every year brings refinement and an air of professional excellence. This is due solely to the efforts of everyone involved.

"The most important thing that I've carried away and hold dearly is the spirit of the event itself. It's the feeling that we are not alone in this sometimes difficult, dangerous profession; that there are others just like us, who strive to make what they do just a little better, safer, and more effective."

### Dan: Had Stomach In Throat

"My name is Sgt. Dan Gregg and I have been employed by the Merrimack (NH) County DOC for 11 years. I am a first shift supervisor and a member of my department's Special Response Team. I am a chemical munitions instructor and less-lethal instructor, and a first-time attendee.

"As I approached the imposing structure of the former penitentiary my heart skipped a beat. The high walls of the prison conjured up visions of a 14th century castle complete with corner towers and ramparts...Later came the siege...CERT teams dressed in black, olive, or camouflage. Some loudly chanting their department name in cadence as they marched past spectators.

"Tactical team members were armed with various types of concealed weapons, and less-lethal delivery systems: MP5s, 45s, Glock 9mms, Smith & Wessons, and Sig Sauers. Thigh-mounted tactical holsters were the order of the day.

"There were shotguns by the dozens, Israeli gas guns, L7 and 40mm launchers, all carried in pride by the invading armies of men and women. NY City Corrections even rolled in their armored APC along with a cruiser and ESU equipment/squad truck.

"They came in large and small groups, some marching in formation, step-dragging, loudly stomping to announce their arrival. A show of force to be sure, all with the same mission however: the preservation of life. These teams were among friends that understood their goals.

"Each team was given a scenario to resolve. They were faced with law enforcement officers and local college students who played the part of rioting inmates, hostages, or injured officers. It was high speed and full on.

"These 'prisoners' were yelling, screaming, and sometimes engaging in not-so-simulated tearing down of the house. Tactical team commanders were issuing—and at times, yelling—orders. Team members were swarming with weapons and delivery systems at the ready yelling the standard command, 'get down on the ground!' to their prisoner adversaries.

"Teams developed, practiced, and executed plans to resolve scenarios. Some teams negotiated hostage situations or conducted tactical entries with flash bangs or chemical munitions.

"While watching the Pennsylvania team conduct its scenario, which took place in the dinning hall, a flash bang went off so close that my stomach was pushed into my throat. The atmosphere was electric.

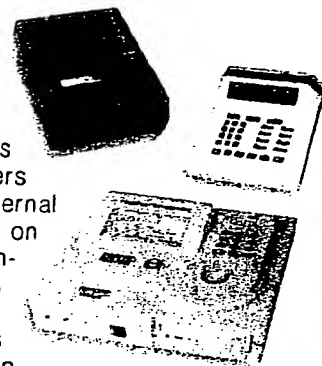
"How many departments have the luxury of having an entire state penitentiary to train in with enough people playing prisoners to give it that real-life feeling?"

Author Jim Topham is a regularly-appearing contributor to CTM Magazine. Photos courtesy of Dan Gregg.

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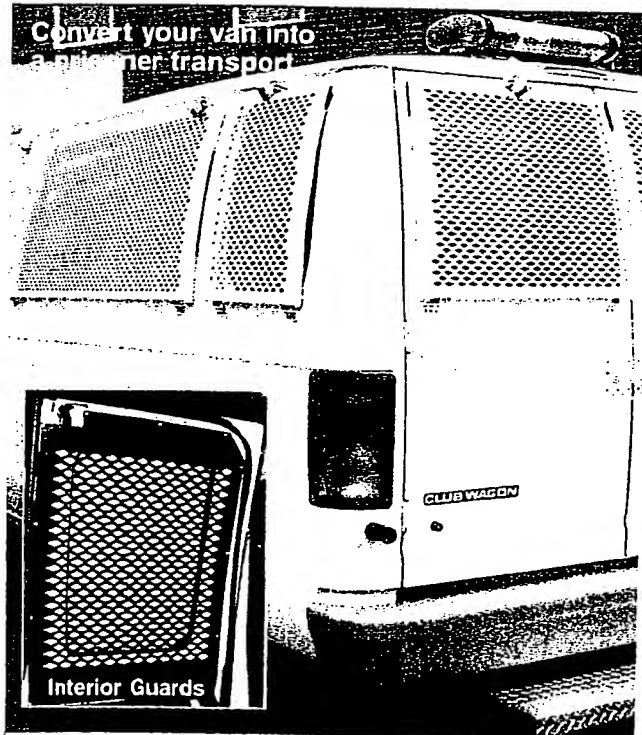
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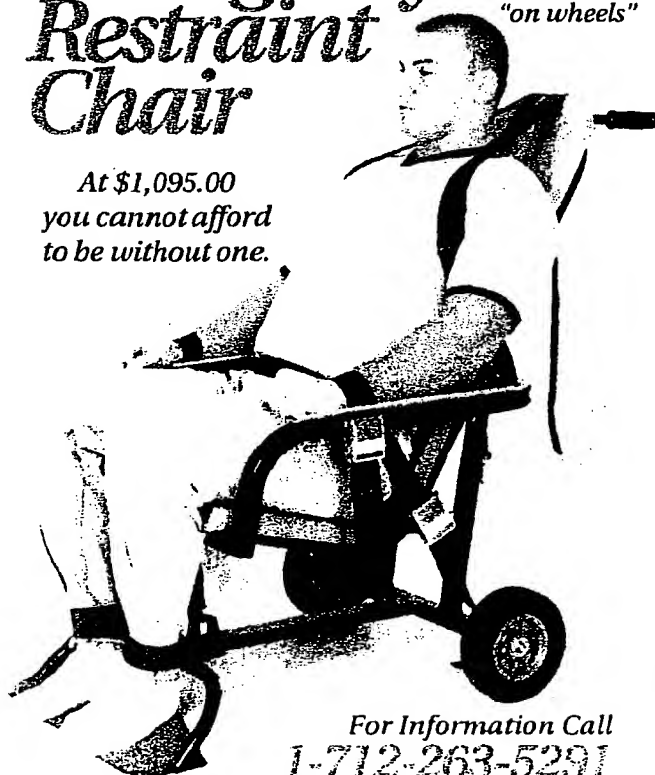
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# LAW ENFORCEMENT TECHNOLOGY

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# The Mus loss-let

*Using less-lethal technologies  
as a "stop-gap"  
as we wait for more  
effective non-lethal  
technologies  
to emerge*



**F**riday, March 24, 2000 — An armed and suicidal male suspect was taken into custody in Springfield, Missouri, after a 37mm round fired into a crowd of inmates. After police arrive and attempt to negotiate, the suspect enters the room and places the gun to his head, shouting, "You do it or I'll do it." One of the officers fires two plastic baton rounds from a 37mm launcher into the suspect's solar plexus causing him to drop the gun and fall to the ground. He was taken into custody without further injury.

Monday, March 27, 2000 — A major inmate disturbance erupts in a jail in the northern portion of Los Angeles County, California. Inmates

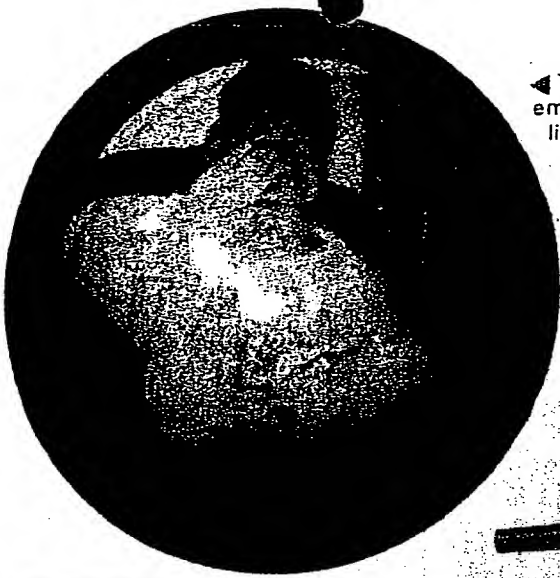
were fighting with fists and feet and repeatedly ignored verbal commands to stop. One deputy armed with a "pepperball gun" fired a burst of 15-17 hollow plastic spheres filled with micro-pulverized pepper (oleoresin capsicum) against a wall near where the inmates were fighting. In a short time the inmates began coughing and stopped fighting. Even inmates who had taken cover underneath mattresses and bedding during the brawl were affected. The decontamination was completed in minutes by sweeping up the dust and then mopping the floor and walls.

Sunday, April 9, 2000 — Police in Victoria, Canada, were confronted by

a male, suicidal suspect, armed with knife and under the influence of cocaine and alcohol. To make matters worse, the suspect was a skilled martial artist and had demonstrated his abilities by kicking the window out of a nearby car and then climbing to the roof of an adjacent building. Officers gained access to the roof and attempted to talk the suspect into surrendering. Eventually, a new Taser was deployed sending a disabling, but otherwise harmless, jolt of electricity into the suspect. Within 2 seconds the suspect fell prostrate and was handcuffed without further incident.

Monday, June 19, 2000 — A drug man making threats at officers at





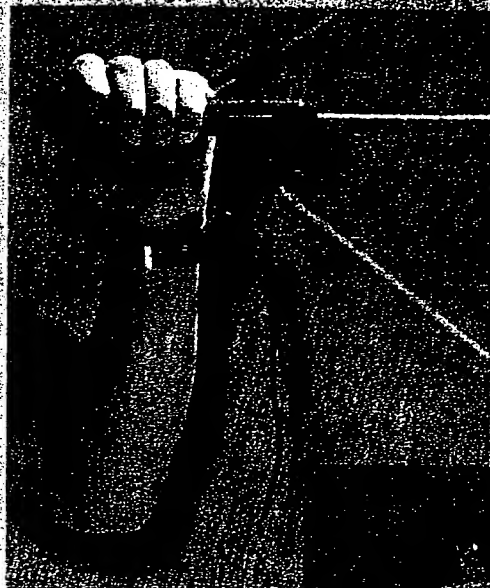
▶ The Laser Dazzler from LE Systems is a less-lethal device that employs directed energy. It works by safely focusing an intense green light on a suspect's eyes, which results in a dazzling effect. A green laser is used because the eye is more sensitive to that color than the more common red lasers. It is eye-safe at the aperture. The device is slightly larger than a common flashlight.



▶ Pepperball from LE Systems employs hollow, ball-like projectiles that are filled with a non-lethal irritant. The projectiles are fired from a pump-action device that is slightly larger than a common flashlight.

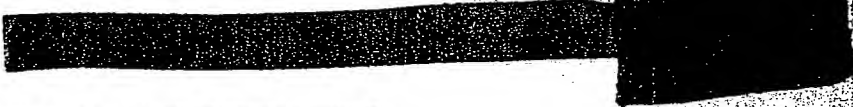


▶ Using a jolt of electricity, the new Advanced Taser (Model 26) from Taser International is virtually indestructible, very lightweight, has only one moving part, uses a laser sight and is non-lethal at the muzzle. It is effective to about 21 feet.



▶ The Optimal Projection System (OPS) is a non-lethal device that delivers a stream of compressed air to propel a projectile. It is effective to about 21 feet.

▶ A.L.S. Technologies' Rubber Fin Stabilized Projectile and Tail Stabilized Bean Bag employ a polymer gas seal and propellant combination for exceptionally consistent performance from zero to 120 degrees Fahrenheit. The Rubber Fin fires a 6-inch group at 100 feet and the Tail Stabilized fires a 5-inch group at 60 feet.

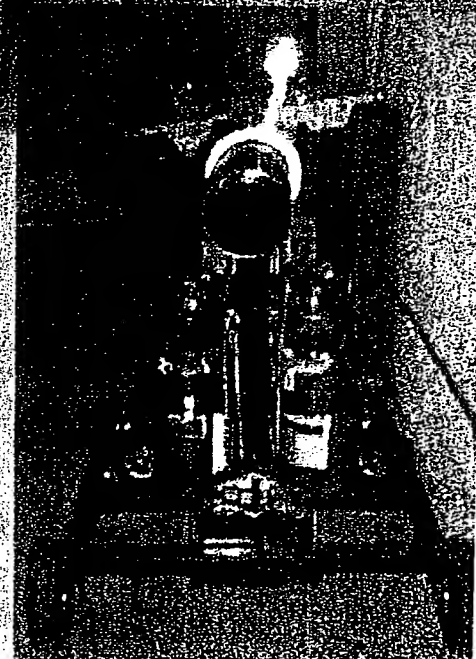


▶ The Peace Keeper, sometimes called a "bladder bullet," uses a soft rubber, liquid-filled projectile that releases its excess kinetic energy by bursting on impact. It can be filled with any liquid

such as water, chemical agents, dye-markers or taggants. They will be available in the spring of 2001 and are reportedly effective from about 4 yards to as much as 100 yards.

▶ A working prototype of the Torodial Vortex Launcher is being developed by SARA

Laboratories. Using a spiraling mass of air that is launched through the atmosphere, this device may someday provide advantages as an "impact" device and/or a chemical delivery device.



# The push for less-lethal

shooting holes in his home with a 9mm pistol was subdued by police in Everett, Washington, with bean bags launched from a conventional shotgun. Later, the suspect thanked the officers for bruising rather than killing him.

While each of these situations occurred at different times, under different circumstances, and involved different law enforcement functions, there are two common themes. First, they are all typical of situations encountered daily by law enforcement agencies throughout the world, and second, they were each resolved by new less-lethal technologies. In fact, had it not been for these new less-lethal technologies, it is virtually certain that serious injuries would have been inflicted upon suspects and officers alike.

## The quest for less-lethal

Historically, law enforcement has never had the latest technology and

has been required to "make do" with conventional and sometimes obsolete tools. Problems resulting from such things as excessive force or terminat-

*Historically,  
law enforcement  
has been required  
to "make do"  
with conventional  
and sometimes  
obsolete tools.*

ing pursuits have been handled as a matter of procedure rather than some new technology. For example, the "accepted" solution to stopping fleeing vehicles has not been a demand for a tool to stop vehicles but rather pro-

cedures limiting the circumstance that allow pursuits.

In the 1990s, this situation began to improve due to a series of societal changes. Americans were growing frustrated with law enforcement's seemingly ineffectual efforts to safeguard communities. As citizens grew tired of being victimized, victims rights organizations began to spring forth, taking active roles in community oriented policing and influencing supporting legislation. "Three Strikes Laws" were passed to remove the habitual criminal from society for longer periods of time. Other laws mandated victims be compensated by requiring the criminal to pay restitution as a condition of probation or by permitting a forum in court for friends, relatives and victims of violent crimes to express grief and outrage during sentencing procedures. Many of these laws have been collectively called the victims "Bill of Rights."



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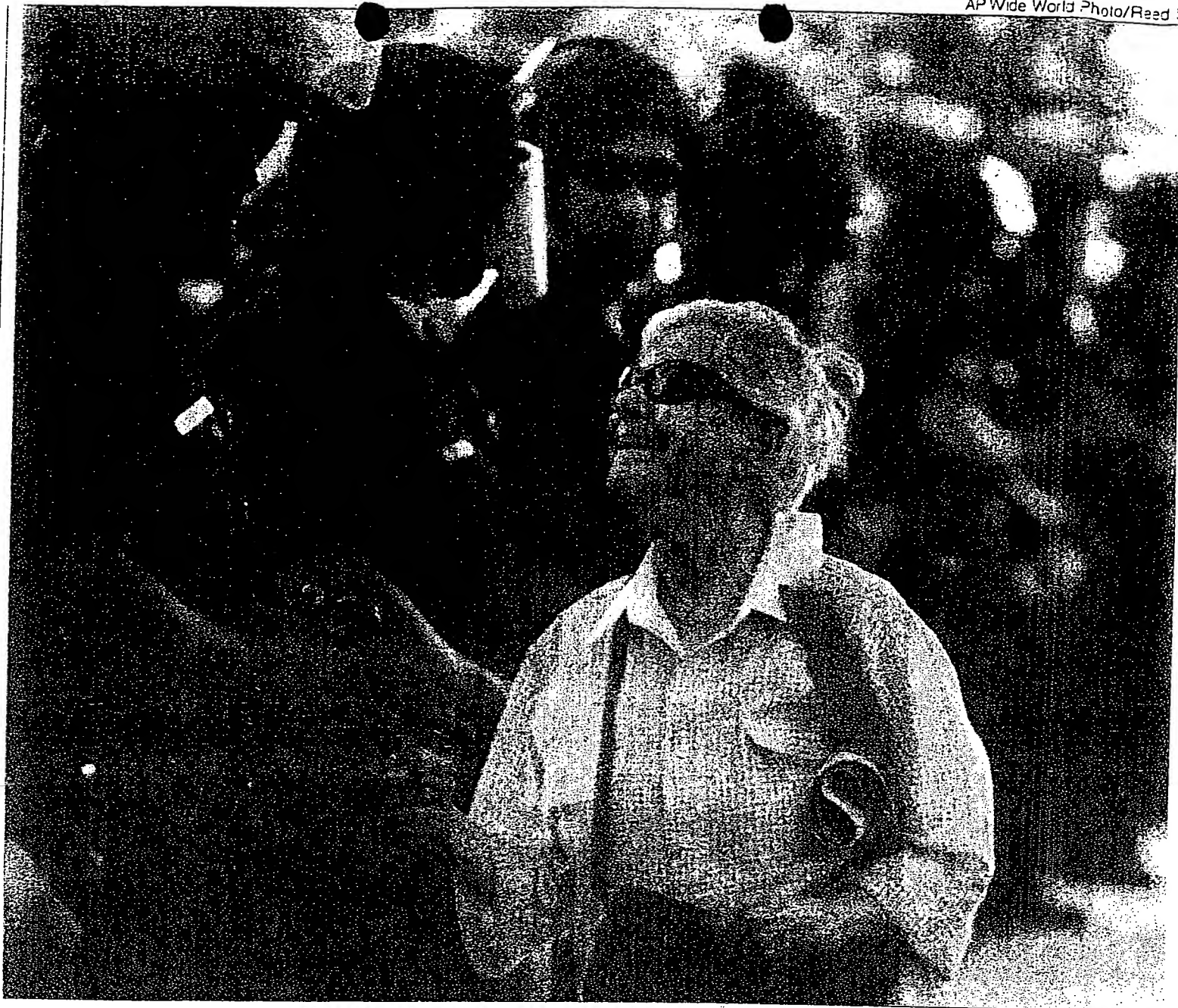
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Yetta Stromberg Sosin, 90, of West Los Angeles, was at the recent Democratic National Convention. Ms. Sosin was a union activist in the 1920s. LAPD cops were ready to deal with mayhem after studying recent demonstrations in Seattle, Washington, D.C. and Philadelphia. One novel plan was to use so-called "paint-ball" guns, a non-lethal weapon effective at controlling large groups without injury. A typical paint-ball gun holds up to 10 balls, which have a biodegradable shell. Instead of paint, the projectiles are filled with pepper spray.

# American Police Beat





October 2000

# LAW ENFORCEMENT TECHNOLOGY

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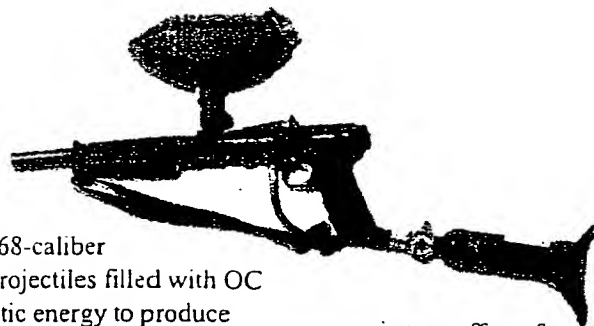
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A18

# Less Lethal

## Less-lethal projectile

The PepperBall System, by Jaycor Tactical Systems, uses .68-caliber high-pressure air, recoilless launchers to fire hard frangible projectiles filled with OC powder. The PepperBall Projectiles impact with enough kinetic energy to produce temporary bruises or welts. Response to inhaling the OC powder from a PepperBall Projectile varies among individuals. In most cases, the same effects occur as when using pepper spray: involuntary closure of the eyes, burning sensation of the skin, and



a respiratory effect of gagging or coughing. The symptoms last between 5 and 10 minutes. Medical care will not be required for suspects shot with projectiles in most cases; fresh air and cool water is sufficient for recovery.

Suspects can be accurately targeted at distances up to 30 feet. PepperBall Projectiles also can be used for area saturation by targeting hard surfaces at distances up to 100 feet. PepperBall Launchers are available in pistol and rifle configurations with capacities ranging from eight to 200 rounds. In addition to the OC PepperBall Projectiles, inert powder and liquid PepperBall Projectiles also are available for training.

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- © The USAS-12 semiautomatic shotgun from Ramo Defense Systems is a gas-operated, closed bolt, close assault weapon. It is fed from either a 10 round box or an optional 20 round drum. The weapon is recoil attenuated for unparalleled control and reliability.
- © The unique design of the USAS-12 shotgun allows the user to fire lethal as well as non-lethal ammunition. The forward grip assembly acts as a charging handle for less lethal fire control in pump operation. There are no levers, switches, or dials to switch between pump and semiautomatic operation.
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## Bean bag

The #23DS, by Defense Technology Corporation of America, an Armor Holdings Company, is a 12-gauge drag stabilized bean bag round designed to provide special response teams with a specialty impact munition. Its tear-shaped design and multi-tail stabilizing system contributes to its superior accuracy, while its double-wall construction embodies a blend of cotton and the latest ballistic materials that enhance the strength and integrity of the munition. When fired, it's projected down range to the target for accurate execution. The round is effective against individuals exhibiting aggressive behavior, or in crowd or riot control and "suicide-by-cop scenarios."

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**Market Review**

2000-2001

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**Police and Security Equipment  
2000-2001 (Continued)**

Charles Heyman  
 August 2000

**Chemical Irritant Launchers** - There are several new chemical irritant products that have been developed to give officers more variations on a safe and effective alternative to the use of firearms. One such example of this class of less-lethal weapon is the PepperBall™ System, used recently in Seattle during the violent protests connected with the World Trade Organisation meeting.

**Resembling paint ball equipment**, PepperBall compressed air pistol and rifle launchers fire projectiles which combine a safe level of kinetic impact with a oleoresin capsicum (OC) irritant in powder or liquid form. As the projectiles strike individuals they break apart, enveloping them with a cloud of OC powder or liquid vapour. The launchers are available with capacities of up to 200 rounds and are even reportedly safe at point blank range.

**Personal Defence Weapons (PDW)** - The concept of a 'Personal Defence Weapon' originated from the military where there was a need for a weapon smaller than an assault rifle, but more powerful than a sub-machine gun. The aim was for soldiers to have a compact PDW to enable them to survive on the battlefield by having the capability of engaging enemy troops in soft body armour at relatively short battle ranges out to 200 metres.

**Arms manufacturers and the police** have quickly realised that this type of weapon may be an ideal option to tackle today's armed criminal. Two examples of this genre are FN Herstal's P90 and Heckler & Koch's PDW.

The P90 from FN Herstal is a futuristic looking bullpup weapon using a simple blow-back firing mechanism fed from a translucent 50 round magazine. Although originally developed for the

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FOREIGN REPORT



military it has been tailored for police purposes, for example by modifying the selective fire to a single shot option and accommodating tactical accessories, such as optics, white lights and lasers.

The PDW from Heckler & Koch has a 20 or 40 round magazine capacity and features a folding fore-grip and a retractable butt stock. It is fitted with a detachable reflex sight and can be fired from either shoulder. It has the same controls as the rest of the Heckler & Koch family of firearms which simplifies training.

Both weapons fire small calibre, high velocity ammunition (5.7x28 mm FN, 4.6x30 mm H&K) which defeat soft body armour. These lightweight bullets lose momentum rapidly and therefore present a low 'down range' hazard, which is of particular concern in densely populated areas. The shape and weight of the bullets, although potent against body armour material, slew around and decelerate quickly after passing through soft tissue and are less likely to over-penetrate a human target than conventional carbine rounds.

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## Technology

# RED

### One Type Of Ball Inmates Don't Want To Play Catch With

**Jim Topham**

*The author volunteered to get shot with OC during this training course for a system that included OC pepper rounds and a launcher.*

A demonstration and certification course was held earlier this year for the PepperBall System, made by a company called Jaycor Tactical Systems. This system consists of a pepperball launcher loaded with OC rounds to deliver kinetic impact with OC irritant.

The system seeks to provide corrections officers with another alternative to compliance systems. The launcher fires a .68 caliber pepper ball round filled with OC powder. Operation of the SA200 launcher is by means of compressed air.

Not to be confused with paint pellet guns, this system allows corrections agencies to bring a less-lethal delivery sys-



A dedicated pepper ball system such as this could have disadvantages too. It may not work on heavily clothed or padded subjects. OC does not work on certain subjects. There could be a greater opportunity for misuse due to the high rate of fire and round capacities.

Policy and procedure issues for departments to place this system within the department's use-of-force options would need to be reviewed.

The pepper ball—a powder projectile—is a filled, frangible sphere that contains a five percent concentration of OC. The operating temperature range on these rounds is -30F to 150F. Environmentally there were considerations (just as there are with a hand-held aerosol) such as wind, humidity, temperature, surrounding people, and places. The reported shelf-life of these rounds was two years, similar to other OC products.

Operational issues with the rounds or projectiles included the inmate's clothing. This is a key to the targeting of the individual and operation of the round.

It's possible that the round would not break on inmates wearing heavy jackets, multiple layers, or loose fitting clothing. To adjust for this, it was recommended to change the aiming point to target shins, knees, and the large muscle groups of the legs.

Due to the delivery system you can also saturate an area from a greater

tem into a secure perimeter to deal with a multitude of problems.

Earlier this year, a county inmate in California with a history of assaults on staff refused to go to court and lockdown. The inmate, sitting on a day-room table waiting for staff to enter, prepared for a confrontation.

The officers opened the pod door and struck the inmate four times with these pepper ball rounds fired through the launcher. The inmate immediately laid down on the table and gave no resistance. There were no injuries to the inmate or the officers. The inmate suffered the effects of OC. From the first round being fired to when the inmate was handcuffed, 15 seconds had elapsed.

The pepper ball system has applications for corrections. Like police simulations, it can have realistic training capabilities and real-world uses.

A formal range was not required

with this system. During a training course that was conducted, a trash can was turned upside-down with an orange T-shirt placed over it as the makeshift target. For the targeting of the launcher, it was center mass so no retraining for the system was needed. (Note: With this system the throat, face, and eyes should never be targeted.)

It had measurable and specific targeting, unlike burning munitions, and could be used to saturate a specific area. With the system, fewer officers could control a larger number of inmates and the system could be used to deny access or egress to specific areas.

Some advantages (from the course):

- less-lethal
- simple and quiet operation
- safe at point blank range
- less crossfire consequences
- accurate and no recoil
- high capacities





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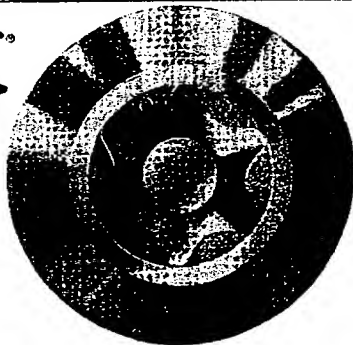
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distance so when dealing with heavy clothing you can alternately target hard objects near and around the inmate such as walls, ceilings, vehicles, and the ground.

The SA200 rifle is operated with a 3,000-psi high-pressure air bottle (HPA). It is a semi-automatic with a 200 round capacity. It is 33 inches in length and weighs 3.5 pounds. Velocity is factory set at 300 feet to 350 feet per second. It has a firing rate of 6 rounds per second. The company has a pistol model and other rifle models that have semi-automatic and fully automatic capabilities.

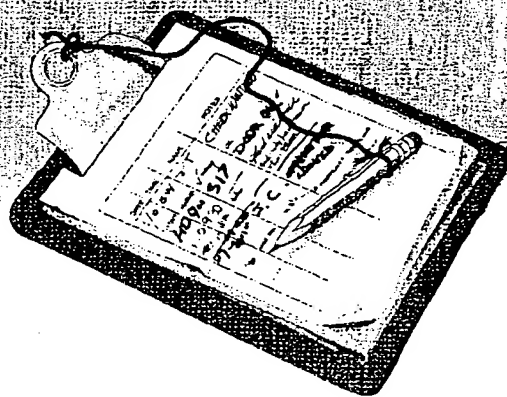
There are two types of delivery mechanisms or bottles that run the launchers. There is the HPA bottle and CO2. For corrections the most practical fill station is the HPA tank or a SCUBA tank. One HPA tank will give a person between 20 to 30 bottle refills. The HPA is easily filled, portable, and less expensive. One bottle, depending on the psi, can give a person a 150-200+ round capability.

This product gives the warden, administrator, supervisor, tactical team leader, and corrections officer another use-of-force option before having to go hands-on, which can always be dangerous for both staff and inmates.

*Author Jim Topham is a regularly-appearing contributor to CTM Magazine.*

*Photos by Mark C. Ide.*

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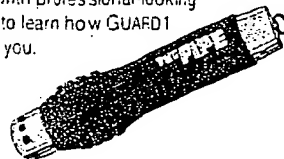
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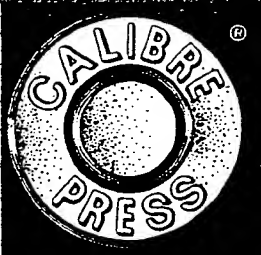
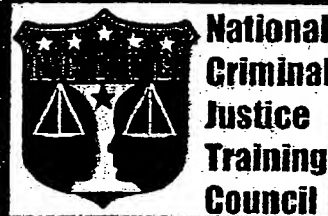
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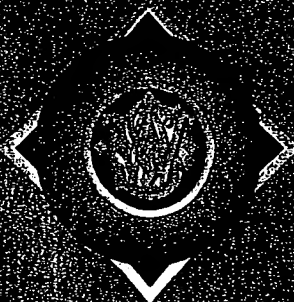
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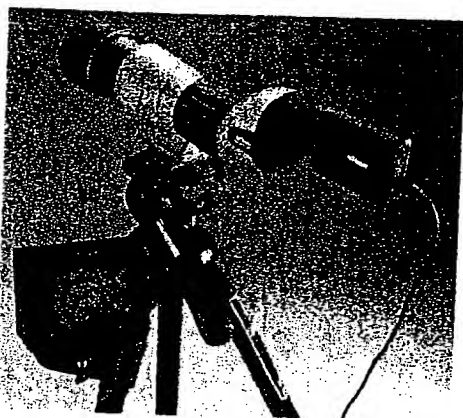


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## NIKON ANNOUNCES FIELD IMAGE SYSTEM MX

Nikon has introduced a revolutionary viewing accessory for its Fieldscope series of spotting scopes. The Field System MX is an 80x CCD camera system (equivalent to a 4000mm lens) that attaches to a Nikon Fieldscope in place of an eyepiece. The field image system is linked to a 4" LCD Color monitor via a six foot RCA cord. The result is a high resolution imaging device that allows group viewing or remote observation, and can be linked to a camcorder to produce a video recording.



For more information, contact: Nikon Sport Optics, 1300 Walt Whitman Road, Melville, NY 1174 Phone (800)-BIRDING. www.nikonusa.com

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rary bruises or welts, and cause a psychological impression of being shot, which is combined with the strong irritation of the OC powder to the suspect's respiratory system. Suspects can be accurately targeted at distances up to 30 feet. They can also be used for area contamination by targeting hard surfaces at distances up to 100 feet.

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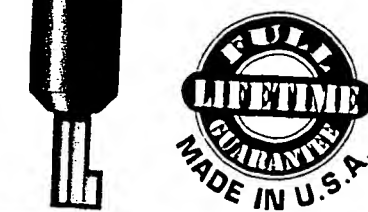
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# Peacekeeping Duties Bolster Demand for Kinder Weapons

by Stephen Willingham

**T**he involvement of U.S. troops in peacekeeping operations around the world has created a growing demand for so-called "non-lethal" weapons. Many of these systems—which have been in use by law enforcement agencies for many years—generally are designed to incapacitate people and vehicles, without necessarily causing death.

The idea is "that we don't have to burn the village to save it," said Marine Col. George Fenton, director of the Joint Non-Lethal Weapons Directorate (JNLWD). He spoke at a non-lethal defense seminar hosted by the National Defense Industrial Association, in Tysons Corner, Va.

But Fenton and other officials at the conference agreed that non-lethal is a misnomer because many of the weapons currently labeled "non-lethal," such as rubber munitions, in fact, can kill a person under certain circumstances.

The U.S. Marine Corps has been at the forefront in the use of non-lethal weapons in military operations. This, however, "does not mean that they can't kill or injure," said Fenton. He explained that the goal of his program is to develop a system that can "minimize fatalities," while, at the same time, provide robust tools for things such as crowd control. "We [aim to] incapacitate individuals, deny access and clear facilities and structures" of people who are considered opponents but also are non-combatants.

"While everybody else [in the U.S. military] is downsizing," he observed, "we are growing." The non-lethal directorate was created by congressional mandate under the 1996 National Defense Act. It has a budget of

about \$24 million. The demand for non-lethal systems has grown proportionally to the reluctance of U.S. military commanders to use lethal fire against civilians, even in combat operations.

Because every conflict is broadcast on live television today, Fenton noted, U.S. leaders do not want to trigger a public opinion backlash. When angry mobs are the enemy, for example, U.S. forces want to have alternative forms of dealing with them that do not require lethal fire. "Having overwhelming firepower does not mean that you can win," said Fenton.

He believes there should be a mix of lethal and non-lethal capabilities available to U.S. troops, so they have options at hand depending on the circumstance.

"There's a niche that only non-lethal will fit," asserted Marine Lt. Gen. Raymond P. Ayres Jr., deputy chief of staff for plans, policies and operations. "Decisions have to be made on an individual basis, rather than the classic model of a rifleman in a regiment where individual decisions are not generally required. Humanitarian missions such as Kosovo, Bosnia and Haiti have changed the decision-making process."

John J. Cline, systems manager at the Army Materiel Command's non-lethal program office, explained that U.S. soldiers have access to "non-lethal capability sets." These are pre-packaged metal containers that include 57 types of items, ranging from non-lethal weapons, munitions and training gear, to protective equipment—such as helmets, face-shields and body armor.

Among the tools designed for crowd control are standard-issue items such as teargas, pepper spray and capsicum powder, flash-

bang grenades and hand-held riot batons.

These non-lethal capability sets are pre-positioned in strategic spots around the world, so they are more easily accessible to soldiers in deployments, said Fenton. The Marine Corps has fielded 27 of these sets.

The Army plans to purchase 30 sets, at a rate of five per year, said Maj. Gen. Joseph Cosumano, assistant deputy chief of staff for operations and force development. Each set is designed to support a company of approximately 200 soldiers.

## Army's New Vision

Cosumano supports the concept of combining lethal and non-lethal capabilities. He believes that non-lethal systems could become important players in the Army's effort to field lighter and more mobile units that would be suited to lower-scale contingencies and peacekeeping operations.

Having non-lethal capability as an alternative to lethal force—and being able to switch back and forth between the two—gives commanders significant flexibility, Cosumano believes.

"In the future, battlefields will be more distributed and will cover a wider area [than they do now]," Cosumano said. "We will be tasked to control the wide spaces as we go for more important targets and by-pass lesser ones. Soldiers will need to immobilize these and then move on to important targets."

The ability to control these "wide spaces" will be enhanced by the commander's access to non-lethal options, explained Fenton. In practical terms, this means being able to shift from non-lethal to lethality without changing weapons platforms, which is known in non-lethal warfare parlance as "rheostatic capability."

One example of such capability would be an airborne, tactical laser system mounted on either a fixed-wing aircraft or a helicopter.

Fenton noted that, with such a system, U.S. forces could target military convoys that have non-combatants mixed in with enemy

## Non-Lethal Weapon Technology Primer

**Claymore-style rubber bullet mine:** This version has a range of 30 meters. Mounted on a tripod, it is intended to fire a blitz of rubber bullets at approximately chest height. Scheduled for 2001.

**40mm crowd dispersal cartridge:** Affords indirect fire capability using an M203 grenade launcher. The canister scatters a wide pattern of rubber pellets. Scheduled for early 2001.

**Portable vehicle arresting barrier:** A perimeter security device that deploys from what appears to be a speed bump. A fully deployed net can stop a 7,000-pound vehicle moving at 40 mph. The net remains secured around the vehicle following the stop, thus trapping any occupants inside. Scheduled for the third quarter of 2000.

**Ridged foam:** Quick aerosol application that hardens almost instantly with air contact. The foam is intended to block doorways, secure motor vehicles or create barriers. Scheduled for 2002.

**Non-lethal 81 mm round:** It is used for down range, indirect

fire-support. The rounds deliver either beanbags or rubber bullets. They are not scheduled for production yet. This non-lethal capability is still in the planning stage.

**66mm vehicle mounted non-lethal grenade launcher:** It is an indirect fire-support system that could deliver either a distraction device such as flash/bang, or kinetic impact devices such as sponge grenades or rubber batons. The production of this system has not been scheduled.

## Non-Lethal Systems Already in Use

**Instant Banana Peel:** It is a slippery surface coating first used for riot control in 1972 to deny either foot or vehicular travel.

**Flash/bang grenade:** It is intended to scare people away and not incapacitate them. The idea is for non-combatants to leave the scene. It can cause temporary vision impairment and hearing loss.

**Concussion grenades:** They explode at 160 decibels and cause temporary deafness.

**Acoustic dazzler grenade:** It explodes at 145-155 decibels

and lasts for up to 45 seconds. It is considered more disorienting than the concussion grenade.

**Aero-rubber ring:** Fired from a grenade launcher, it is a rubber baton round. This hard rubber projectile is effective at 40-50 meters. It was designed for crowd control after the Kent State shootings in 1970.

**Oleoresin Capsicum:** It is better known as pepper-balls and is fired by a CO2 gas cartridge. It has the same effect as pepper spray but is delivered in powder form from a greater distance.

**Sponge grenade:** Fired from a 40mm grenade launcher, this device is either a metal or plastic mass covered in front with a soft sponge-type surface. It is a blunt-trauma instrument that is designed to stun. Currently, it is used by the Marine Corps.

**Rubber baton:** A hard rubber projectile that resembles a stopper or a plug more than an actual baton, it is used against massed crowds. The South Africans used to fire them from machine guns. They called them "sausages." The South African version was designed to rumble for greater impact.—by Stephen Willingham

troops. The opponents' vehicles would be disabled by frying the electrical systems, without causing any human deaths.

On one occasion, Fenton said, Iraqi gunners placed anti-aircraft batteries on the roofs of hospitals. That situation would have offered an ideal opportunity for employing airborne lasers, he said.

"Lasers are not necessarily non-lethal and have to be used with precision and caution," Fenton added.

Today, soldiers are trained in both lethal and non-lethal methods. "We will still train soldiers in the basic skills of self-protection and mission accomplishment," Cosumano said. But Army leaders increasingly will expect soldiers to become more multi-faceted in their war-fighting capabilities.

Selected units will specifically be trained in non-lethal weapons applications and techniques for crowd control and dispersal, he said. They also will learn new rules of engagement that will be more closely aligned with their particular missions, Cosumano added.

### Non-Lethal Training

"Just to carry an M-16, you have to qualify," said Marine Maj. Steven A. Simpson, deputy director of concepts and requirements division at JNLWD. "The same standard will also apply to non-lethal weapons."

Maj. Steve Ijames of the Springfield, Mo., Police Department, is a nationally respected instructor in non-lethal weapons. He told the conference that, in recent years, U.S. police forces had learned valuable lessons from their British counterparts, who had experience in containing unruly crowds in Northern Ireland.

Ijames stressed the importance of proper training in the use of non-lethal munitions on human subjects. Among the more popular kinetic impact devices are so-called beanbag and sockbag rounds.

In 1971, in Grants, N.M., a beanbag round caused its first known fatality, he said. Normally, it takes more than a single round to sufficiently incapacitate a subject, said Ijames.

A square beanbag fired from a .12 gauge shotgun has about the same impact as a line-drive hit in baseball, he explained.

But he cautioned that smooth bore, single projectiles, such as beanbags, are hard to control. Among the more recent experiments was the use of a sock round with an attached dragline, which increased accuracy to beyond 15 feet. At that distance, square beanbags generally begin to lose accuracy. Both beanbags and sock rounds are filled with number nine shot. A sock round looks remarkably like a sock, with the foot and toe area filled with shot and then tied off, with the remainder allowed to

act as a tail or dragline.

In general, Ijames said, police shooters like to keep a distance of 21 feet between themselves and a single subject. If the subject is moving, this becomes more problematic. With crowds, he said, they prefer a 30-foot gap. The longest hit with a beanbag occurred at around 67 feet, he said.

Ijames recommended not shooting at the chest, where a person normally should be able to take a punch. Authorities have confirmed that at least six people have been killed in the United States and Canada since 1971, with non-lethal weapons. Ijames said that, in each case where a fatality occurred, a chest shot had been attempted. He recommended aiming for other vulnerable, soft tissue areas of the body, such as the abdomen and lower back.

Ijames did not recommend using kinetic impact devices from short distances. One industry representative, whose company supplies non-lethal rounds to the Navy, noted that firing from distances shorter than 10 feet is considered unsafe.

"Even the best tools are useless without proper training in how to use them," said Bob Walsh, president and director of research and development at Technical Solutions Group, a non-lethal weapons contractor located in Charleston, S.C.

"You can hurt yourself or other people."

While working for the Navy's science assistance program, Walsh helped assemble the "less-than-lethal" weapons package for U.S. forces in Somalia. Walsh said that the non-lethal capability sets and the concept of "force continuum" came out of this experience.

He explained that force continuum means that "you take control of the situation before it takes control of you," he said. Untrained troops tend to allow a crowd to mingle and assemble for too long before they act. "By then, it may be too late," he warned.

### Define Objectives

"Non-lethal is not a silver bullet. It is not an end-all," said Air Force Brig. Gen. John Barry, director of headquarters strategic planning.

To make the most effective use of non-lethal

systems, he said, objectives have to be defined clearly. He noted that the United States currently uses other non-lethal tactics such as information warfare, electronic warfare, military deception and psychological operations.

It should not be assumed that a non-lethal military force is gentle, he said.

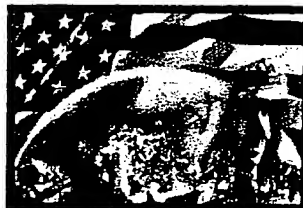
"If you have a non-lethal deterrent, you have to have a lethal backup, especially if you go at it on an incremental basis. Then, of course, there are treaty concerns [that have to be considered] when it comes to using lasers," Barry said. He specifically cited international bans against the use of lasers as a blinding weapon.

Another reason for favoring non-lethal weapons, he said, is because "you can avoid the costs of destroying the target and then having to pay to rebuild it." Energy-pulse bombs, such as those used against the Belgrade electrical power grid in last year's war against Yugoslavia, is one example of a successful non-lethal system, Barry added.

Barry believes that non-lethal weapons have a place in strategic planning, as long as they are accompanied by conventional lethal force.

On a humorous note, one industry official from San Antonio pointed out: "If Santa Ana had used non-lethal weapons, no one today would remember the Alamo."

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# Inside CORRECTIONS TECHNOLOGY

Supplement to  
*The Corrections  
Professional*

May 2000

## Paintball technology calms uprising

In late April, a riot spurred by racial tension broke out at the **Smith Unit** in Lamesa, Texas. Although no corrections officers were injured, when all calmed down, one inmate lay dead and 25 others were injured.

Although such incidents aren't uncommon, a method recently employed to calm prison unrest certainly is.

**Jaycor Tactical Systems** has designed a non-lethal weapon that uses paintball spheres containing oleoresin capsicum instead of paint. That's the ingredient in pepper spray widely used by police departments.

After a demonstration of the **PepperBall** technology at the **Fairfax County Police Academy**, police departments in Northern Virginia and several state DOC facilities are considering adding **PepperBall** to their non-lethal arsenal.

Both Fairfax and Alexandria police have given **PepperBall** approval, and Arlington County has decided to purchase at least one **PepperBall** launcher, which is accurate up to 30 feet from the target. The launcher is powered by carbon dioxide gas and is capable of firing 12 rounds per second. Fairfax County still is examining the liability aspects of **PepperBall**.

The benefits of **PepperBall** over other crowd-calming technology, are its ability to pinpoint specific individuals and reduced contamination to surrounding areas. Another plus is that after its implementation in Seattle, officer injuries dropped sharply.

The drawbacks include the fact that it cannot be used if it is extremely windy or rainy, or if officers are more than 30 feet away from the target.

The **PepperBall** technology was first used in Seattle during the protests of the World Trade Organization talks last year.

Source: NLECTC.

## Essential communication still absent when officers' lives are at stake

In 1998, the U.S. Department of Justice recognized that in major situations, crucial communication between public safety organizations was lacking. Too often, emergency services, corrections, police and fire personnel have had to use hand signals and runners rather than radios to communicate.

During outbreaks or prison riots, police from neighboring jurisdictions drive alongside one another to coordinate plans. Incidents inside prison walls have to be relayed via telephone or through COs on the outside to coordinate offensive tactics.

While radios would be the logical and optimal mode of communications in each instance, equipment used by one department sometimes is incompatible with another department's.

To emphasize the need for changing the way jurisdictions plan and coordinate the design of their communications systems, the justice department's **National Institute of Justice** produced a 13-minute video, *Why Can't We Talk?* The video was designed as a public education campaign and provides an executive summary of the growing importance of interoperability. It's an effort to foster informed decision making in the planning, design and funding of public safety communications systems.

Almost two years after that effort, however, the problem remains as pervasive as ever and the **NIJ** is stressing, once again, its importance.

"Protecting the residents of the United States is an enormous challenge," said **Attorney General Janet Reno**. "The nation's law enforcement, fire, public safety

(See **TALK** on page 4)

## Spotlight on . . .

### Profiling antibodies as a means of identification

Individual specific antibodies, which are naturally occurring antibodies in the human body, are being mapped and used in a technique called the **Antibody Profile Assay** to identify individuals.

The technique, developed by the **Idaho National Engineering and Environmental Laboratory** and **Miragen**, a biotechnology company, could be a useful tool in law enforcement, because this type of antibody is unique to each person and the test takes only two hours to complete.

Corrections professionals and law enforcement personnel currently rely on DNA testing, which takes between 24 hours and three weeks to complete. According to **Vicki Thompson**, an **INEEL** researcher, the **Antibody Profile Technique** only requires bodily fluid, not DNA material. The fluid can even be identified when mixed with dirt or animal blood, or when dried on sidewalks and cars, **Thompson** explained. The technique is being tested for validity so that it can be used in the courts, **Thompson** said.

Source: NLECTC.



April 2000

# LAW ENFORCEMENT

## TECHNOLOGY

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# Are Your Computers Protected?

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# WEAPONS TECHNOLOGY

By Craig Beery

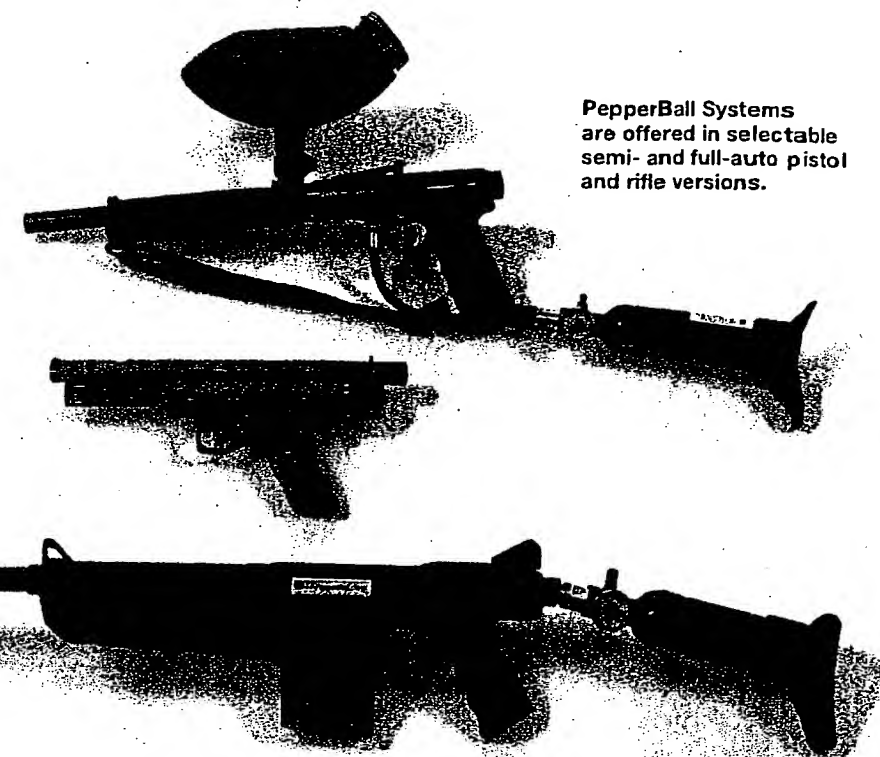
## PepperBall System breaks new rounds

**F**or all of you who closely follow the latest developments in the compliance technology field, you may already be aware of the PepperBall System from Jaycor Tactical Systems, based in San Diego, California. If you're wondering what a PepperBall System is, please take this short quiz.

Quick: What product in the compliance technology arena offers the following feature set? Up to a 200-round capacity, a 0- to 30-foot individual targeting range, a mix of kinetic impact and chemical agents, and is safe at point-blank range. Give up? It's the PepperBall System, the same system that the Seattle (Washington) Police Department used in late 1999 to help quell the highly orchestrated World Trade Organization riots.

As a law enforcement chemical agent instructor for many years, I have often told students in our 40-hour instructors' course that if someone in the industry were able to invent a new way of putting chemical agents on people, it could change the way officers deal with situations that have historically posed a big challenge for law enforcement. Well, Jaycor has done just that.

We all know the type of situation I am referring to. It's Friday night and Joe Blow has had a bad workweek. He gets crazy on drugs or alcohol, takes a baseball bat or a knife out into his front yard and wants to take on all comers. Patrol officers get the call and respond with their typical complement of compliance tools. Depending on where you work, this may include a handheld aerosol chemical agent device, a baton or other short-range kinetic impact weapon, a pain-compliance tool such as a nunchuck, perhaps



PepperBall Systems are offered in selectable semi- and full-auto pistol and rifle versions.

a taser or stun device, and maybe a long-range kinetic impact weapon such as a beanbag round fired from a 12-gauge shotgun.

With the exception of the beanbag round (which becomes more lethal the closer it's deployed on the suspect), none of the compliance tools listed is going to be of much use on the suspect in our scenario. If the suspect has a knife or baseball bat, you obviously don't want to get close enough to endanger your own safety. Most less-lethal experts agree that the magic number for officer safety distance is 21 feet or farther. Which brings up the final question on the nightly police quiz show, "Who Wants to Go Home Safe Tonight?" "What weapons do you have in your compliance tool kit that give you a comfortable margin of safety and do not become more lethal as you get closer to the suspect?" You

are two for two if you answered the PepperBall System.

### Early years and issues

The PepperBall System has been undergoing research and development at Jaycor for the past five years. Ed Vasel, a senior scientist with Jaycor for 19 years, thought that it would be interesting to use paintball technology to deliver chemical agents from a distance.

Some of the design and environmental issues that Jaycor had to address included targeting ranges, accuracy, temperature-operating range, reliability, and ease of use. For those of you who train and play with paintball technology, you are undoubtedly aware of some of its limitations. Paintballs use a soft gel covering to encapsulate marker dyes, and are easily broken, both inside and outside the

launchers. They also are very susceptible to heat and cold. On a hot summer day in the trunk of a car, paintball markers will melt or blister. Conversely, any of you living in colder climates know that frozen paintballs will put a world of hurt on you, and have the ability to break skin. For sport, paintballs work fine. For the real world of police work, however, paintballs have negligible crossover value due to the aforementioned limitations. Jaycor was able to address these issues and combine the best of two well-established technologies: chemical agents and kinetic impact.

### The system

The PepperBall System uses .68-caliber high-pressure air and carbon-dioxide recoilless launchers to shoot hard, breakable projectiles filled with OC powder at individuals from distances up to 30 feet. As the projectiles break on a suspect's torso (no-target zones are the face, eyes and throat), a cloud of OC powder is released that enters the suspect's eyes and respiratory system, with the same effect as a handheld aerosol application. The PepperBall projectiles also add a kinetic impact of 6 to 7 foot-pounds of energy (given 300 feet per second velocity) to the chemical agent equation, making it a truly unique type of compliance system. In contrast, beanbag rounds usually strike with 120



Live-fire PepperBall training can be conducted in a classroom environment.

foot-pounds, while paintballs impact with 9 to 10 foot-pounds of energy. One big difference from paintballs, however, is that PepperBall projectiles are comprised of a hard casing, causing similar blunt trauma — but more sting. Suspects definitely know they are being shot, while at the same time being exposed to the effects of OC powder. The hard casing ensures that rounds do not break in the breech or barrel, lowering maintenance considerations with system launchers.

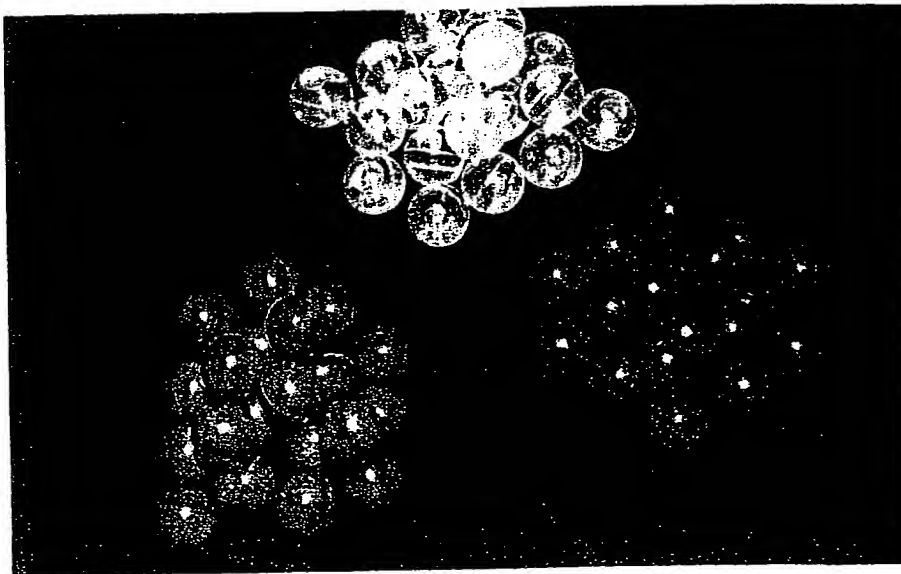
Current PepperBall launcher systems offer pistol and rifle configurations in selectable semi- and full-auto versions with capacities ranging from

eight to 200 projectiles. What other system can you think of that is available to law enforcement that offers 200 rounds of anything? This high-capacity capability also provides for safer suspect targeting as officers can afford to err on the side of caution. I advise PepperBall operators to start low, avoiding the no-target zones of the throat, face and eyes. Starting low and "walking" rounds to the center of the chest can avoid potential eye or face injuries.

The current line-up of projectiles and their color codes includes live OC powder (red), inert powder (blue), inert scented powder (purple), and inert liquid (clear). The inert rounds allow for very realistic training both indoors and outdoors. Other projectiles currently under development include a live liquid OC round, and a glass-shattering round.

### Environmental and targeting considerations

For area contamination in riot situations, PepperBall projectiles have a 100-foot range. Anytime chemical agents are used, environmental conditions such as wind direction, temperature and humidity need to be taken into consideration. When using PepperBall projectiles in a riot situation with favorable wind conditions, OC powder can be dispersed on a crowd by skip-breaking the rounds on the pavement just in front of the rioters, letting the wind drift the chemical



PepperBalls deliver more sting than paintballs and the effects of OC powder. Pictured here are training and live OC PepperBall projectiles.

# WEAPONS TECHNOLOGY

agent throughout the area. In cold weather zones, suspect clothing is an important consideration when evaluating individual targets. For example, if a suspect is wearing a heavy jacket or very loose clothing, there is the possibility that the PepperBall projectile will be "caught" without breaking. In those cases, lowering the suspect target zone to impact rounds on the

lower torso and legs, or striking projectiles off nearby walls or other hard objects could provide a solution.

## Training

An additional benefit to the PepperBall System is ease of training. For most less-lethal systems, a formal firing range is required, with the attendant issues of space reservation,

requirements for range safety or firearms instructors on site, and scheduling issues, such as finding officers to fill-in for officers attending the training. PepperBall Systems do not need to be fired on a formal range. Training can be conducted in the parking lot of a patrol station, or in the basement of a correctional facility, using inert liquid and powder training rounds. By allowing officers more opportunities to familiarize themselves with the PepperBall System, they can gain greater confidence in the system's capabilities when deploying the system in an actual situation.

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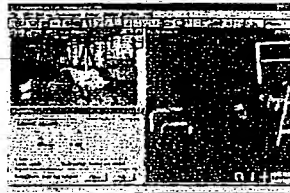
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## Who may purchase the system?

Jaycor has been awarded U.S. and foreign patents for PepperBall Systems, with several other patents pending. The PepperBall System is only sold to law enforcement and government agencies, including the military. PepperBall Systems are in place in police agencies in Washington, California, Texas, Florida, Louisiana, Colorado, Missouri, Georgia and Arizona. The National Guard, Coast Guard and Marines also are looking at PepperBall technology to help solve some of their "missions other than war" mandates. As anyone in law enforcement knows, having the right tool for the right situation is the key to effectively dealing with the variety of interactions that occur between police officers and suspects. The PepperBall System is definitely one of the tools that an agency should look at when developing its compliance technology tool kit. □

*Craig Beery is director of sales and training for Jaycor Tactical Systems. He is a former sergeant on the San Diego (California) Sheriff's Department and co-teaches the 40-hour P.O.S.T. chemical agents instructor course in California. He can be reached at [cbeery@pepperball.com](mailto:cbeery@pepperball.com) or 858/535-3138.*

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